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EXAMINER
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ART UNIT	PAPER NUMBER
2628	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/719,773	STEEN, ERIK N.
	Examiner	Art Unit	
	Roberta Prendergast	2628	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/3/2007*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)   4)☐ Interview Summary (PTO-413)
                                                    Paper No(s)/Mail Date. _____ .
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5)☐ Notice of Informal Patent Application
3)☐ Information Disclosure Statement(s) (PTO/SB/08)   6)☐ Other: _____ .
    Paper No(s)/Mail Date _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 16, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hatfield et al. U.S. patent No. 5779641 in view of Hossack et al. U.S. Patent No.

6116244.

Referring to claim 1, Hatfield et al. teaches graphics processing circuitry

comprising a graphics processing unit (Fig. 1(element 20)), a system interface coupled

to the graphics processing unit (Fig. 1(element 8); column 1, lines 52-57), and a

graphics memory coupled to the graphics processing unit (Fig. 1 (element 6)), the

graphics memory comprising an image data block storing image data entries for at least

one ultrasound beam (Figs. 1(elements 14A and 14B) and 6(element 80); column 2,

lines 5-11, 16-30, and 39-47, i.e. B-mode image data and colorflow image data are

stored in graphics memory 14A and 14B), a vertex data block storing vertex entries that

define rendering shapes (Figs. 1(element 18) and 6(element 70, 72, and 78); column 2,

lines 39-63, , i.e. coordinate transformation of the colorflow and B-mode data is

performed to produce appropriately scaled coordinate display pixel data in x-y graphics

memory and the graphics data produces graphics overlays that are understood to be

the rendering shapes defined by the vertex entries and rendered onto the image plane

via ray-casting), and rendering plane definitions (Figs. 1(element 24) and 6(element 80);

column 2, lines 50-65; column 9, lines 16-45, i.e. it is understood that the image plane

graphics memory contains rendering plane definitions that define the shape of the

object), where the graphics processing unit accesses the image data entries and vertex

entries to render a volume according to the rendering plane definitions with blending

parameters for selected image data entries (columns 8-9, lines 52-11; column 9, lines

45-67; column 10, lines 3-19; column 11, lines 47-66; column 12, lines 1-5, i.e. the

graphics processing unit accesses the image data entries to retrieve the scaled image

plane data and then accesses the vertex entries to supply the region of interest pixels to

the convolution filter and then filters the pixels according to the weighting

coefficients/blending parameters stored in the look-up table at which time the projection

technique is applied until all projected images are stored in cine memory and can then

be selected by an operator for display) but does not specifically teach wherein the

graphics processing unit renders the volume using alpha blending in accordance with

the blending parameters.

Hossack et al. teaches wherein the graphics-processing unit renders the volume

using alpha blending in accordance with the blending parameters (columns 4-5, lines

61-19).

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify the graphics processing circuitry of Hatfield

et al. to include the teachings of Hossack et al. wherein the graphics processing unit

renders the volume using alpha blending in accordance with the blending parameters

thereby allowing the viewing of internal objects relative to surrounding objects such that

opacity levels are utilized to emphasize areas of clinical interest (Hossack et al: columns

1-2, lines 55-6; column 2, lines 25-25).

Referring to claim 16, the rationale for claim 1 is incorporated herein, Hatfield et

al., as modified above, teaches a medical ultrasound imaging system comprising an

image sensor for obtaining image data from a volume of a region of interest (Fig.

1(elements 2 and 8)), a first memory (Fig. 1(element 14A and 14B); column 2, lines 39-

46, i.e. B-mode data and color flow data are first stored in the acoustic line memories), a

signal processor coupled to the image sensor and the first memory for receiving the

image data and storing the image data in the first memory (Fig. 1(element 8); column 2,

lines 5-11 and 24-46, i.e. B-mode data and color flow data are processed by the B-

mode processor and the color flow processor and stored in the acoustic line memories),

and graphics processing circuitry comprising the elements of claim 1.

Referring to claim 25, claim 25 recites the limitations of claims 1 and 16 and

therefore the rationale for the rejection of claims 1 and 16 are incorporated herein.

Claims 2-8, 17-21, and 27-34 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hatfield et al. in view of Hossack et al. as applied to claim 1 above,

and further in view of Baldwin et al. U.S. Patent No. 4827413.

Referring to claim 2, the rationale for claim 1 is incorporated herein, Hatfield et

al., as modified above, teaches the graphics processing circuitry of claim 1 but does not

specifically teach where the graphics memory further comprises the graphics

processing unit rendering the volume from back to front.

Baldwin et al. teaches where the graphics memory further comprises the

graphics-processing unit rendering the volume from back to front (Abstract; column 1,

lines 10-15 and 44-64, i.e. each slice of the volume is rendered in back-to-front order).

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify the graphics processing circuitry of Hatfield

et al. to include the teachings of Hossack et al. and Baldwin et al. wherein the graphics

processing unit renders the volume using alpha blending in accordance with the

blending parameters, wherein the blending parameters are stored in a look up table that

maps sample values to blending parameters, thereby allowing the viewing of internal

objects relative to surrounding objects and further allowing the modulation of opacity

parameters associated with the image parameters so that some regions of the display

image are emphasized such that opacity levels are utilized to emphasize areas of

clinical interest (Hossack et al: columns 1-2, lines 55-6; column 2, lines 25-25; column

3, lines 54-61; column 5, lines 1-19) and wherein the graphics memory further

comprises the graphics processing unit rendering the volume from back to front thereby

generating two-dimensional images of three-dimensional objects without the need for

time consuming surface contour or boundary detection algorithms and since the back-

to-front algorithm does not require the checking of a projected voxel's depth, as do

algorithms requiring surface information, the display memory is updated by a relatively

quick write operation (Baldwin et al.: column 1, lines 23-43).

Referring to claim 3, the rationale for claim 2 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 2 but does not specifically teach where the blending parameters are stored in the image data block.

Hossack et al. teaches wherein the blending parameters are stored in the image data block (column 2, lines 55-67; column 3, lines 9-32; column 9, lines 14-21, i.e. it is understood that the opacity values are blending parameters and they are stored along with the color values in the image data block). The motivation statement of claim 2 is incorporated herein.

Referring to claim 4, the rationale for claim 2 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 2 but does not specifically teach where the blending parameters are stored in a look up table that maps sample values to blending parameters

Hossack et al. teaches where the blending parameters are stored in a look up table that maps sample values to blending parameters (column 2, lines 55-67; columns 3-4, lines 54-19, i.e. the color value and opacity level/blending parameter for each datum/voxel being output from the look-up table indicates the mapping of sample values to blending parameters). The motivation statement of claim 2 is incorporated herein.

Referring to claim 5, the rationale for claim 2 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 2 but does not specifically teach where the blending parameters are transparency values.

Hossack et al. teaches where the blending parameters are transparency values (column 4, lines 2-4 and 61-65; column 9, lines 14-21, i.e. the alpha/opacity value is

understood to be the transparency value). The motivation statement of claim 2 is
incorporated herein.

Referring to claim 6, the rationale for claim 2 is incorporated herein, Hatfield et
al., as modified above, teaches the graphics processing circuitry of claim 2 where the
image data block stores a first dataset of image data entries for a plurality of ultrasound
beams of a first type (Fig. 1(element4A)), and a second dataset of image data entries
for a plurality of ultrasound beams of a second type (Fig. 1(element 4B)), and wherein at
least one of the vertex entries specifies a vertex spatial position, a texture pointer into
the first data set, and a texture pointer into the second dataset (column 6, lines 34-45;
column 10, lines 58-61; column 11, lines 47-52, i.e. each of the vertex entries contains
pixels, represented by a vertex spatial position, includes both intensity data and velocity
or power data).

Referring to claim 7, the rationale for claim 6 is incorporated herein, Hatfield et
al., as modified above, teaches the graphics processing circuitry of claim 6 where at
least one of the first type and second type is colorflow (Fig. 1(element 4B)).

Referring to claim 8, the rationale for claim 6 is incorporated herein, Hatfield et
al., as modified above, teaches the graphics processing circuitry of claim 6 where at
least one of the first type and second type is B-mode (Fig. 1(element 4A)).

Referring to claim 17, claim 17 recites the limitations of claims 2 and 16 and
therefore the rationale for the rejection of claims 2 and 16 are incorporated herein.

Referring to claim 18, claim 18 recites the limitations of claims 3 and 17 and
therefore the rationale for the rejection of claims 3 and 17 are incorporated herein.

Referring to claim 19, claim 19 recites the limitations of claims 6 and 16 and therefore the rationale for the rejection of claims 6 and 16 are incorporated herein.

Referring to claim 20, claim 20 recites the limitations of claims 7 and 19 and therefore the rationale for the rejection of claims 7 and 19 are incorporated herein.

Referring to claim 21, claim 21 recites the limitations of claims 8 and 19 and therefore the rationale for the rejection of claims 8 and 19 are incorporated herein.

Referring to claims 27 and 28, claims 27 and 28 recite the limitations of claims 4, 5, and 25 and therefore the rationale for the rejection of claims 4, 5, and 25 are incorporated herein.

Referring to claim 29, claim 29 recites the limitations of claims 4 and 25 and therefore the rationale for the rejection of claims 4 and 25 are incorporated herein.

Referring to claims 30-32, claims 30-32 recite the limitations of claims 6 and 25 and therefore the rationale for the rejection of claims 6 and 25 are incorporated herein.

Referring to claim 33, claim 33 recites the limitations of claims 7 and 25 and therefore the rationale for the rejection of claims 7 and 25 are incorporated herein.

Referring to claim 34, claim 34 recites the limitations of claims 8 and 25 and therefore the rationale for the rejection of claims 8 and 25 are incorporated herein.

Claims 9, 10, 22, 23, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatfield et al. in view of Hossack et al. and Baldwin et al. as applied to claim 6, 19, and 31 above, and further in view of Drebin et al. U.S. Patent No. 4835712.

Referring to claim 9, the rationale for claim 6 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 6 but does not specifically teach where at least one of the first and second types is local image gradients.

Drebin et al. teaches where at least one of the first and second types is local image gradients (Abstract, lines 1-12; column 3, lines 34-44; column 13, lines 24-31, i.e. a gradient vector is generated for each voxel by calculating the change in opacity and the gradient in the X, Y, & Z direction of the 3D voxel array is used to calculate the gradient length and the RGBA values are multiplied by the gradient length).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the graphics processing circuitry of Hatfield et al. to include the teachings of Hossack et al., Baldwin et al. and Drebin et al. thereby allowing the viewing of internal objects relative to surrounding objects and further allowing the modulation of opacity parameters associated with the image parameters so that some regions of the display image are emphasized such that opacity levels are utilized to emphasize areas of clinical interest (Hossack et al: columns 1-2, lines 55-6; column 2, lines 25-25; column 3, lines 54-61; column 5, lines 1-19), generating two-dimensional images of three-dimensional objects without the need for time consuming surface contour or boundary detection algorithms and since the back-to-front algorithm does not require the checking of a projected voxel's depth, as do algorithms requiring surface information, the display memory is updated by a relatively quick write operation (Baldwin et al.: column 1, lines 23-43) and further providing shading that provides for

the rendering of surfaces and boundaries to subvoxel accuracy wherein surfaces

remain but solid regions become more transparent such that objects can be viewed

which partially obscure other objects and spatial relationships between objects can be

accurately rendered (Drebin et al.: column 3, lines 24-44).

Referring to claim 10, the rationale for claim 9 is incorporated herein, Hatfield et

al., as modified above, teaches the graphics processing circuitry of claim 9 but does not

specifically teach a light source definition stored in the graphics memory.

Drebin et al. teaches a light source definition stored in the graphics memory

(Abstract, lines 13-18; column 19, lines 50-61; column 20, lines 11-21, i.e. a light vector

L is generated and stored in temporary work space of the graphics/picture memory).

The motivation statement of claim 9 is incorporated herein.

Referring to claim 22, claim 22 recites the limitations of claims 9 and 19 and

therefore the rationale for the rejection of claims 9 and 19 are incorporated herein.

Referring to claim 23, claim 23 recites the limitations of claims 10 and 19 and

therefore the rationale for the rejection of claims 10 and 19 are incorporated herein.

Referring to claim 35, claim 35 recites the limitations of claims 9 and 25 and

therefore the rationale for the rejection of claims 9 and 25 are incorporated herein.

Claims 11, 12, 15, 24, and 36-38 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Hatfield et al. in view of Hossack et al. and Baldwin et al. as applied

to claims 1, 16, and 25 above, and further in view of Vining U.S. Patent No. 6083162.

Referring to claim 11, the rationale for claim 1 is incorporated herein, Hatfield et

al., as modified above, teaches the graphics processing circuitry of claim 1 where the

vertex data block has a first set of vertex entries that define the rendering plane

definitions where the graphics processing unit accesses image data entries and the first

set of vertex entries to render a volume according to the rendering plane definitions with

blending parameters for the selected image data entries but does not specifically teach

where the vertex data block has a second set of vertex entries that specifies an

anatomical model wherein the graphics processing unit accesses image data entries

and the first set of vertex entries to render a volume according to the rendering plane

definitions with blending parameters for the selected image data entries and the second

set of vertex entries to render the anatomical model.

Vining teaches a second set of vertex entries that specifies an anatomical model

(Fig. 2(element 14); column 13, lines 60-66, i.e. the wireframe model is stored in the

form of a set of vertices and interconnecting line segments that define the anatomical

model) wherein the graphics processing unit accesses image data entries (Fig.

2(element 12); column 9, lines 26-32) and the first set of vertex entries to render a

volume according to the rendering plane definitions with blending parameters (column

10, lines 39-50; column 11, lines 1-24; column 14, lines 15-51, i.e. the coronal, sagital,

axial, or transverse planes are rendering plane definitions and the opacity value is the

blending parameters) for the selected image data entries and the second set of vertex

entries to render the anatomical model (Figs. 2 and 7; column 7, lines 21-56; columns

13-14, lines 60-15, i.e. the isosurface model is first created by using the first set of

vertex entries to render an isosurface model according to the rendering plane definitions

and the blending parameters and then a wireframe model is applied to the isosurface

model to render the anatomical model).

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify the graphics processing circuitry of Hatfield

et al. to include the teachings of Hossack et al. and Vining wherein the graphics

processing unit renders the volume using alpha blending in accordance with the

blending parameters, wherein the blending parameters are stored in a look up table that

maps sample values to blending parameters, thereby allowing the viewing of internal

objects relative to surrounding objects and further allowing the modulation of opacity

parameters associated with the image parameters so that some regions of the display

image are emphasized such that opacity levels are utilized to emphasize areas of

clinical interest (Hossack et al: columns 1-2, lines 55-6; column 2, lines 25-25; column

3, lines 54-61; column 5, lines 1-19) and where the vertex data block has a second set

of vertex entries that specifies an anatomical model wherein the graphics processing

unit accesses image data entries and the first set of vertex entries to render a volume

according to the rendering plane definitions with blending parameters for the selected

image data entries and the second set of vertex entries to render the anatomical model

thereby providing a rendering step that occurs rapidly and interactively and that gives

the user the ability to "fly" through the volume of data (Vining: column 14, lines 52-61).

Referring to claim 12, the rationale for claim 11 is incorporated herein, Hatfield et

al., as modified above, teaches the graphics processing circuitry of claim 11, but does

not specifically teach where the anatomical model is a pre-generate model of anatomical structure present in the volume to be rendered.

Vining teaches wherein the anatomical model is a pre-generate model of anatomical structure present in the volume to be rendered (Fig. 17; column 6, lines 56-65; column 7, lines 35-39, i.e. the anatomical model is a selected subvolume/target volume of the dataset to be displayed). The motivation statement of claim 11 is incorporated herein.

Referring to claim 15, the rationale for claim 1 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 1 but does not specifically teach where the graphics processing unit accesses the image data entries and vertex entries to render a volume absent an at least one cut away plane.

Vining teaches where the graphics processing unit accesses the image data entries and vertex entries to render a volume absent an at least one cut away plane (column 16, lines 1-51). The motivation statement of claim 11 is incorporated herein.

Referring to claim 24, claim 24 recites the limitations of claims 11 and 16 and therefore the rationale for the rejection of claims 11 and 16 are incorporated herein.

Referring to claim 36, claim 36 recites the limitations of claims 11 and 25 and therefore the rationale for the rejection of claims 11 and 25 are incorporated herein.

Referring to claim 37, claim 37 recites the limitations of claims 11 and 36 and therefore the rationale for the rejection of claims 11 and 36 are incorporated herein.

Referring to claim 38, claim 38 recites the limitations of claims 11 and 37 and therefore the rationale for the rejection of claims 11 and 37 are incorporated herein.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatfield et al. in view of Hossack et al. as applied to claim 1 above, and further in view of Karron et al. U.S. Patent No. 5898793.

Referring to claim 13, the rationale for claim 1 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 1 but does not specifically teach where the rendering shapes are triangles.

Karron et al. teaches where the rendering shapes are triangles (Figs. 9(element 250), 10, 14 and 17; column 4, lines 59-67; column 14, lines 17-32).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the graphics processing circuitry of Hatfield et al. to include the teachings of Hossack et al. and Karron et al. wherein the graphics processing unit renders the volume using alpha blending in accordance with the blending parameters, wherein the blending parameters are stored in a look up table that maps sample values to blending parameters, thereby allowing the viewing of internal objects relative to surrounding objects and further allowing the modulation of opacity parameters associated with the image parameters so that some regions of the display image are emphasized such that opacity levels are utilized to emphasize areas of clinical interest (Hossack et al: columns 1-2, lines 55-6; column 2, lines 25-25; column 3, lines 54-61; column 5, lines 1-19) and where the rendering shapes are triangles thereby providing high quality interactive display of the surface structures of interest from a set of collected data while minimizing the effects of possible noise interference

and further providing a plurality of three-dimensional surface views from a single set of collected data (Karron et al.: column 3, lines 58-67; column 4, lines 21-30).

Referring to claim 14, the rationale for claim 1 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 1 but does not specifically teach where the rendering shapes are triangles and where the vertex entries define at least one triangle strip.

Karron et al. teaches where the rendering shapes are triangles and where the vertex entries define at least one triangle strip (Figs. 9(element 250), 10, 14 and 17; column 4, lines 59-67; column 14, lines 17-32). The motivation statement of claim 13 is incorporated herein.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatfield et al. in view of Hossack et al. as applied to claims 1 and 25 above, and further in view of Ramanujam U.S. Patent No. 5570460.

Referring to claim 26, the rationale for claim 25 is incorporated herein, Hatfield et al., as modified above, teaches the graphics processing circuitry of claim 1 where the step of initiating comprises the step of initiating ray-cast volume rendering (Abstract, lines 8-11; column 4, lines 5-10; column 6, lines 3-20) but does not specifically teach where the step of initiating comprises the step of initiating front to back volume rendering using alpha blending.

Ramanujam teaches where the step of initiating comprises the step of initiating front to back volume rendering using alpha blending (column 2, lines 13-21 and 32-54; column 3, lines 30-33; column 5, lines 30-63; column 6, lines 11-26).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the graphics processing circuitry of Hatfield et al. to include the teachings of Hossack et al. and Baldwin et al. wherein the graphics processing unit renders the volume using alpha blending in accordance with the blending parameters, wherein the blending parameters are stored in a look up table that maps sample values to blending parameters, thereby allowing the viewing of internal objects relative to surrounding objects and further allowing the modulation of opacity parameters associated with the image parameters so that some regions of the display image are emphasized such that opacity levels are utilized to emphasize areas of clinical interest (Hossack et al: columns 1-2, lines 55-6; column 2, lines 25-25; column 3, lines 54-61; column 5, lines 1-19) and where the step of initiating comprises the step of initiating front to back volume rendering using alpha blending thereby providing a unique blending function that is ideally suited for front-to-back rendering, wherein pixel color will no longer be updated when the opacity reaches saturation, that is implemented in the graphics processor itself and speeds up the volume rendering process when compared to the ray-casting approach (column 6, lines 2-10).

Response to Arguments

Applicant's arguments filed 1/3/2007 have been fully considered but they are not persuasive.

Applicant argues, with regards to claims 1, 16 and 25 "...Hatfield states that the "'scan converter/display controller 6 in cooperation with master controller 8, also formats multiple images for display, display annotation, graphics overlays and replay of cine loops aid recorded timeline data." (column 1, line 67 to column 2, line 4). This description clearly indicates that the graphics overlay is merely a formatting function and not used for any type of rendering as suggested in the Office Action.", "...Nothing is rendered or formed from this overlay and, thus, the overlay cannot be a rendering shape. This overlay is used to help clinicians view the images as clearly evidenced by the statement in Hatfield that this formatted data including the graphics overlays "aid recorded timeline data."..." and "The Office Action states that the "graphics data produces overlays that are understood to be the rendering shapes defined by the vertex entries." (Office Action, page 3). However, there is no support for this conclusory statement. In fact, the specification of the Hatfield reference clearly supports a different conclusion, namely that the graphics overlays are simply graphics overlaid on an image. There is no support for interpreting the graphics overlays to mean rendering shapes. The overlays are formed on the images and not used to form the image itself. The Office has not met the requisite burden to support a rejection wherein graphics overlays are rendering shapes. Accordingly, the combination of Hatfield et al. and Hossack et al.

fails to describe or suggest at least some of the elements recited in independent claims 1, 16 and 25."

Examiner respectfully submits that although the scan converter/display controller formats multiple images for display, display annotation, graphics overlays and replay of cine loops aid recorded timeline data, that in no way precludes the production and rendering of the graphics overlays onto successive image planes that are stored as separate frames and then superimposed on the last background frame thus making the graphics overlays, that are in the shape of the object, rendering shapes since they are being rendered, see column 4, lines 5-10 and 25-47; columns 11-12, lines 47-14.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberta Prendergast whose telephone number is (571) 272-7647. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RP 3/9/2007

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER